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Radio 2050

By Thomas Kidd - *January-March 2010*

It can be embarrassing to attempt to predict technology beyond its current development horizon. This is especially challenging when the technology has begun to accelerate exponentially. To predict the future of radio into the second half of the 21st century, we will need to look back at its development from a 19th century oddity, to a 20th century necessity, and into the early years of the 21st century.

The expansion of Maxwell's electromagnetic theory of light by Heinrich Hertz in 1886 starts our timeline.

Radio's first 50 years saw the technology move out of the laboratory and into society. By the mid-1930s, radio, television and radar had become the cutting-edge technology of the day. However, another technology was also in development that would not only eclipse radio as the icon of the future, but would forever change the way radio technology is employed in society. This development, the computer, changed the fundamental building blocks of radio hardware. And it is that marriage of computer to radio that is having the greatest impact on radio's second century.

It has been said of technology that "form follows function." But when the function is formless an interesting opportunity for integration occurs.

In the later years of the 20th century, the function of producing radio waves moved out of the physical dimension of tubes and transistors to become a function of software and microchips.

Today's wireless technology is a chipset capability and no longer a proprietary device. While we will always have legacy technology, somewhere someone is still making buggy whips, the future of radio is to disappear into an integrated interconnected fabric of the world around us.

Within the next decade, radio technology will enable the wireless exchange of information among systems ranging from household appliances to automobiles. The per unit cost of wireless nodes will continue to drop while their capabilities will continue to increase. Lower cost devices will lead to their integration in diverse and unexpected ways.

As we head into the middle of the 21st century we won't be surprised to find that more of our devices are interconnected than are not. Taking a studied look around the typical office or home, we find countless items that will interact with each other in much the same way that we interact with them today.

Where today, a human looks for wear and tear in home or office equipment; in 2050, a device will not only know its level of wear but will communicate with other affected items to manage its deficiencies.

Perhaps our transportation systems will communicate with other systems or devices to optimize our experiences or minimize their impact on our environment.

And the knowledge we collect may interact with the collective knowledge of our friends, family, co-workers, and their devices to anticipate capabilities we may not know we need until they are presented for our use.

While total interconnectivity throughout our environment is unlikely, the ratio of inter-connection to disconnection will be much higher than it is today. All this interconnection will be done wirelessly. Physical connections will be seen as cumbersome and antiquated.

But the radio, as a unique device, will have all but disappeared into the products themselves.

By January 2050, the typical consumer will assume a device is capable of wireless interconnectivity and will be surprised when it isn't.

Thomas Kidd is the director of strategic spectrum policy for the Department of the Navy.

TAGS: Telecommunications, Wireless

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